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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In application of

FENG CHEN

Serial No. 10/661,019 (TI-35765)

Filed September 12, 2003

For: SIGMA-DELTA MODULATOR WITH PASSIVE BNADPASS LOOP FILTER

Art Unit 2819

Examiner Peguy Jean Pierre

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5-20-05

Jay M. Cantor, Reg. No. 19,906

Sir:

BRIEF ON APPEAL

REAL PARTY IN INTEREST

The real party in interest is Texas Instruments Incorporated, a Delaware corporation with offices at 7839 Churchill Way, Dallas, Texas 75251.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals and/or interferences.

STATUS OF CLAIMS

This is an appeal of claims 1, 2, 7, 8 and 19, all of the rejected claims. Claims 13 to 18 and 20 have been allowed and claims 3 to 6 and 9 to 12 have been objected to but have been indicated to be allowable Please charge any costs to Deposit Account No. 20-0668.

STATUS OF AMENDMENTS

An amendment was not filed after final rejection.

SUMMARY OF INVENTION

The invention relates to a method and structure for digitizing a signal which includes the steps or structure for sampling and holding an analog signal to yield a sampled signal, the analog signal comprising information(12), filtering the sampled signal at a passive filter circuit to yield a filtered signal, the passive filter circuit comprising at least one passive element, the filtered signal characterized by a bandpass response (14 and page 3, lines10 to 13) and quantizing the filtered signal to yield a digital signal, the digital signal corresponding to the analog signal, the digital signal comprising the information (16). The analog signal can include an intermediate frequency signal.

ISSUE

The sole issue is whether claims 1, 2, 7, 8 and 19 are anticipated by Connell et al. (U.S. 5,940,447) or Khoury et al. (U.S. 6,1212,910).

GROUPING OF CLAIMS

The claims stand or fall together.

ARGUMENT

Claims 1, 2, 7, 8 and 19 were rejected under 35 U.S.C.102(b) as being anticipated by Connell et al. (U.S. 5,940, 447) or Khoury et al. (U.S. 6,121,910). The rejection is without merit.

Claim 1 requires, among other features, the step of sampling and holding an analog signal to yield a sampled signal, the analog signal comprising information. It is not apparent from Connell et al. that the input to the sample/hold circuit is an analog signal.

Claim 1 further requires the step of filtering the sampled signal at a *passive* filter circuit to yield a filtered signal, the *passive* filter circuit comprising at least one passive element, the filtered signal characterized by a bandpass response. While Connell et al. show a band pass filter circuit, there is no statement in Connell et al. that the circuit is passive as required by claim 1 nor that the filter 104 of Khoury et al. is passive as required by claim 1. Note in Connell et al. that the bandpass filter referred to as network 214 which includes capacitors 216-236 and switches 238-266 is a part of the sampling circuit 36 and not a separate passive filter with bandpass response. In fact, nothing in Connell et al. is stated with reference to the makeup of the circuit 38 other than that it can be a bandpass filter. With reference to Khoury et al, nothing is stated as to the circuitry of filter 104 other than that it can be a bandpass filter. The claim calls for a passive filter. The use of a passive filter provides for lower power consumption and higher resolution than is available with the prior art as known at the time of filing of subject application.

As stated in the title of the invention as well as in the specification, a major purpose of the present invention is to provide a sigma delta modulator with a *passive* bandpass filter and, more specifically, using a *passive* bandpass loop filter. This type of circuitry provides a substantial improvement in power consumption and may provide improvements of other types

wherein the prior art sigma delta modulation, which utilizes active elements, may be unsatisfactory.

The examiner has improperly attempted to shift the burden of proof to appellant because a reference may state that it uses components which are passive. The fact that a circuit utilizes passive components does not make that circuit passive unless all of the components are passive. It is unlikely that a filter circuit using active elements will not also include passive elements. It therefore follows that though passive elements may be mentioned, a circuit is not passive unless it is either shown that all of the elements are passive or a statement is made that the circuit is also passive. Neither alternative appears in either of the applied references. The impropriety of the attempt to shift the burden of proof is further reinforced by the fact that the prior art has always used active filters in the environment of the present invention as stated under oath in the specification of the subject application at page 2. Accordingly, there is and can be no shift of the burden of proof until the examiner first establishes a basis to allege that the filter circuits of the applied references are passive. This he has failed to do.

Claim 2 depends from claim 1 and therefore defines patentably over the applied references for at least the reasons presented above with reference to claim 1.

In addition, claim 2 further limits claim 1 by requiring that the analog signal comprise an intermediate frequency signal. No such limitation is found in Connell et al. or Khoury et al. either alone or in the combination as claimed.

Claim 7 requires, among other features, those features discussed above with reference to claim 1. Accordingly the arguments presented above with reference to claim 1 apply as well to claim 7 and are incorporated by reference.

Claim 7 further requires a comparator coupled to the passive filter circuit and operable to quantize the filtered signal to yield a digital signal, the digital signal corresponding to the analog signal, the digital signal comprising the information. No quantizer appear to be present in Connell et al. and the comparator is not stated to perform a quantizing action.

The arguments further presented in connection with claim 1 apply as well to this claim other than the fact that claim 7 is written in structure rather than method format.

Claim 8 depends from claim 7 and therefore defines patentably over the applied references for at least the reasons presented above with reference to claim 7.

Claim 8 further limits claim 7 by requiring that the analog signal comprise an intermediate frequency signal. No such limitation is found in Connell et al. or Khoury et al. either alone or in the combination as claimed.

Claim 19 requires, among other features, means for sampling and holding an analog signal to yield a sampled signal, the analog signal comprising information. It is not apparent from Connell et al. that the input to the sample/hold circuit is an analog signal.

Claim 19 further requires a passive filter circuit having a passive filter coupled to the sample-hold circuit and operable to filter the sampled signal to yield a filtered signal, the passive filter circuit comprising at least one passive element, the filtered signal characterized by a bandpass response. The discussion with reference to claim 1 is apropos and incorporated by reference.

CONCLUSIONS

For the reasons stated above, reversal of the final rejection and allowance of the claims on appeal is requested that justice be done in the premises.

Respectfully submitted,

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APPENDIX

The claims on appeal read as follows:

1. A method for digitizing a signal, comprising:

sampling and holding an analog signal to yield a sampled signal, the analog signal comprising information;

filtering the sampled signal at a passive filter circuit to yield a filtered signal, the passive filter circuit comprising at least one passive element, the filtered signal characterized by a bandpass response; and

quantizing the filtered signal to yield a digital signal, the digital signal corresponding to the analog signal, the digital signal comprising the information.

2. The method of Claim 1, wherein the analog signal comprises an intermediate frequency signal.

7. A sigma-delta modulator, comprising:

a sample-hold circuit operable to sample and hold an analog signal to yield a sampled signal, the analog signal comprising information;

a passive filter circuit coupled to the sample-hold circuit and operable to filter the sampled signal to yield a filtered signal, the passive filter circuit comprising at least one passive element, the filtered signal characterized by a bandpass response; and

a comparator coupled to the passive filter circuit and operable to quantize the filtered signal to yield a digital signal, the digital signal corresponding to the analog signal, the digital signal comprising the information.

8. The modulator of Claim 7, wherein the analog signal comprises an intermediate frequency signal.

19. A sigma-delta modulator, comprising:

means for sampling and holding an analog signal to yield a sampled signal, the analog signal comprising information;

means for filtering the sampled signal with a passive filter circuit to yield a filtered signal, the passive filter circuit comprising at least one passive element, the filtered signal characterized by a bandpass response; and

means for quantizing the filtered signal to yield a digital signal, the digital signal corresponding to the analog signal, the digital signal comprising the information.